

# RANGE CONSERVATION - TECHNICAL NOTES

AL CHEMICAL PLANT CONTROL



CHAINING PINON JUNIPER

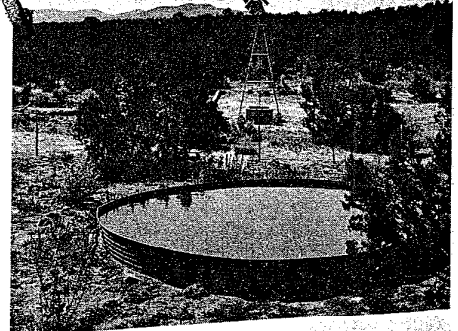


PROPER RANGE USE PAYS

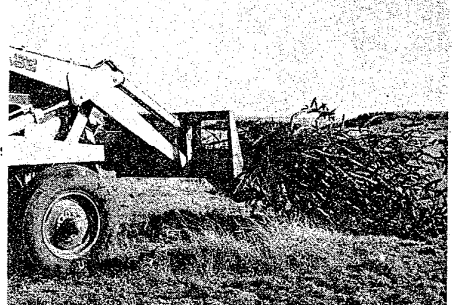


U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
NEW MEXICO

GOOD LIVESTOCK WATERING



CHOLLA CONTROL



RANGE TECHNICAL NOTE NO. 31

July 14, 1967

Subject: RANGE RESEARCH

The following are four abstracts of published range research. This material may have application in assisting New Mexico ranchers develop and apply ranch plans. It also includes useful information about livestock losses caused by range plants. These are from "Abstracts of Recent Published Material on Soil and Water Conservation," No. 38 by the ARS, USDA.

116. Hill, R. M., and Ackerson, C. W. NITRATE IN CATTLE FEEDS CAN BE DEADLY. Nebr. Agr. Expt. Sta. Q. 11(2): 3-5. 1964.

Nitrate is the chief form of nitrogen taken up by growing plants. Usually plants use this nitrogen rapidly for the manufacture of protein and ordinarily only small amounts of nitrate are found upon analysis.

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Occasionally, however, nitrate may accumulate to such an extent as to be dangerous to animals eating the plants.

Nitrate itself is not particularly toxic to animals. When it is eaten, the micro-organisms in the digestive tract convert it to nitrite and finally to ammonia. Nitrite is about 10 times as toxic as nitrate. The nitrite passes into the blood stream where it reacts with the hemoglobin, the oxygen carrier of the blood, to form methemoglobin which is incapable of carrying oxygen. When enough hemoglobin is thus converted, the animal dies of asphyxiation.

Accurate diagnosis of nitrate poisoning is difficult. Clinical symptoms such as abortion, weakness of the new born, infertility, lameness, stiffness, unthriftiness, trembling, and loss of milk production are vague and non-specific symptoms and can all be caused by conditions other than nitrate. One of the best single diagnostic tools is the color of the blood.

If cases of nitrate poisoning can be recognized before they become too far advanced, they can be treated with intravenous injections of methylene blue plus additional vitamin A. The most frequently recommended dose is 4 milligrams of the dye per pound of body weight administered as a 4 percent solution. Any treatment must include elimination of the nitrate containing feeds from the ration.

While relatively few samples analyzed contained lethal levels of nitrate, feedstuffs frequently contained sufficient nitrate to cause concern, especially when they were the sole constituent of an animal ration.

While high nitrate may be found under good growing conditions, drought increases the probability that excess nitrate may occur.

226. Rauzi, F. LIGHT VS. MODERATE GRAZING SHOWS MODERATE BEST ON SHORTGRASS. Wyo. Stockman-Farmer 70(4): 32. Apr. 1964.

Results of long-term research at Archer agricultural substation in Wyoming favored moderate over light grazing on shortgrass rangeland. Duplicate pastures have been lightly and moderately grazed since 1945 by sheep. During a 17-year period (1947-63) moderately grazed pastures averaged 46 sheep days of grazing per acre while those grazed lightly averaged 30 sheep days per acre.

Average lamb gain per acre from moderately grazed pastures during 19 years (1945-63) was 27.6 lb. and from lightly grazed pasture, 17.2 lb.

Herbage production was affected by the following: Kind of grazing animal (sheep, cattle, and/or game animals); past use; available moisture; and dominance and growth characteristics of perennial grasses, weeds, and forbs.

At Archer, perennial grass yields from 1947-63 averaged 513 lb./A. from moderately grazed pastures and 612 lb./A. from lightly grazed pastures.

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227. Cable, D. R., and Martin, S. C. FORAGE PRODUCTION AND STOCKING RATES ON SOUTHERN ARIZONA RANGES CAN BE IMPROVED. U.S. Forest Res. Note RM-30, 11 pp. 1964.

Herbage production of annual and perennial grasses, basal intercept of perennial grasses, and stocking rates have been measured since 1954 on four range units of the Santa Rita Experimental Range, Ariz., primarily to determine the reaction to mesquite control. Mesquites were killed on two of the units between 1954-57 by spraying diesel oil on the lower trunk of each tree.

The changes in vegetation measured during the 8-year period were caused by three main factors: Year-to-year variation in precipitation; management practices; and mesquite control.

The native annual and perennial grasses on these range units are primarily summer growers, and thus depend for their growth primarily on summer rainfall. The correlation between June-September rainfall and perennial grass herbage production was significant, but explained only about 39 percent of the year-to-year variation in production. Annual grass production, on the other hand, was more closely correlated with rainfall; over half of the year-to-year variation in production was explained by variations in June-September rainfall.

Moderate utilization of the perennial grasses combined with alternate summer deferment of grazing resulted in marked range improvement. On the average, production of perennial grasses increased by more than 4 pounds per acre per inch of summer rainfall per year, from about 19 lb./A./in. of summer rainfall in 1954 to about 45 pounds in 1961.

Perennial grass production on the mesquite-killed range units increased relative to the two untreated units between 1957 and 1961. The increase amounted to a net gain of 443 lb./A. on the mesquite-killed units compared to 220 lb./A. on the mesquite-alive units.

Annual grass production was more markedly affected by mesquite density than was perennial grass production. Annual grass production decreased non-linearly from 20 lb./A./in. of summer rainfall with 0.25 percent mesquite crown intercept to 5 pounds with 7 percent crown intercept.

Calculations of stocking rates that would have given 40 percent use of perennial grasses for each unit and year showed that the stocking rates on the two mesquite-killed units have increased an average of 169 percent between 1954 and 1961, compared to an increase of 62 percent on the two mesquite-alive units.

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230. Springfield, H. W. SOME FACTORS AFFECTING GERMINATION OF  
FOURWING SALTBUSH. U.S. Forest Serv. Res. Note RM-25,  
8 pp. 1964.

Fourwing saltbush (Atriplex canescens) is one of the most valuable browse plants on Southwestern ranges. Studies of native stands indicate this species grows under a wide variety of environmental conditions, withstands drought, heat, and cold, and provides palatable, nutritious forage the year round for both game and livestock.

Preliminary information was presented on the effects of differences in source of seed, treatment of seed, and temperatures on germination of fourwing saltbush seed in the laboratory. Several of the findings appear to have application value for range seeding.

Germination of fourwing saltbush varied with source of seed. In a comparison of eight sources, seed collected at Isleta, New Mexico showed significantly higher germination than seed from other sources. The embryos in seeds from some sources exhibited a greater dormancy than seed from others.

Removing the wings from the seed did not improve the total germination of fourwing saltbush. The de-winged seed, however, germinated more quickly than the winged seed. This faster germination is desirable because the right combination of temperature and soil moisture is of short duration in many range areas. Other advantages of de-winging the seed are: (1) Ease of handling, especially when the seed is to be drilled; (2) Reduction in bulk; and (3) Easier coverage with soil.

Temperature strongly influenced germination of fourwing saltbush. Germination of seed from all eight sources was higher at temperatures from 42° to 58° F. than at temperatures of 73° to 77° F. Although the summer months appear unfavorable from the standpoint of temperatures, these months are best when considering dependability and amount of precipitation in the Southwest. Because of the apparent conflict between temperature and moisture factors, further research is needed on the subject.

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